May 24, 1932. W. M. SHEEHAN 1,859,938

RAILWAY UNDERFRAME

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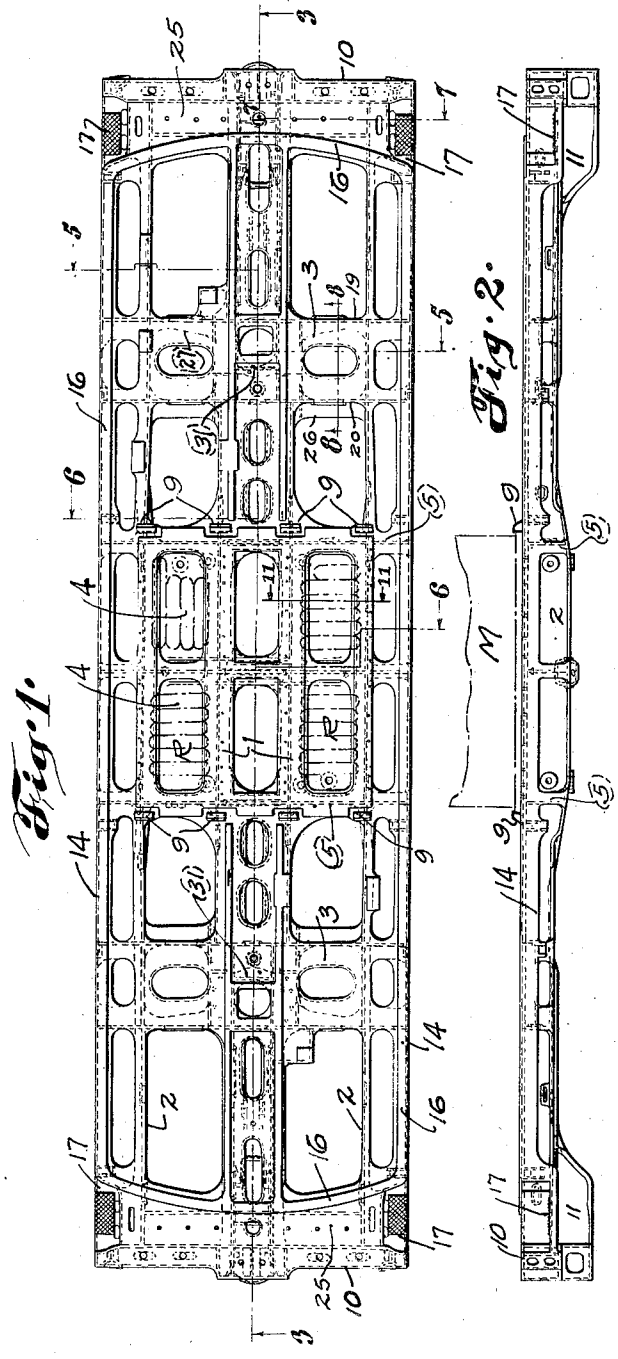

Fig. 1.

Fig. 2.

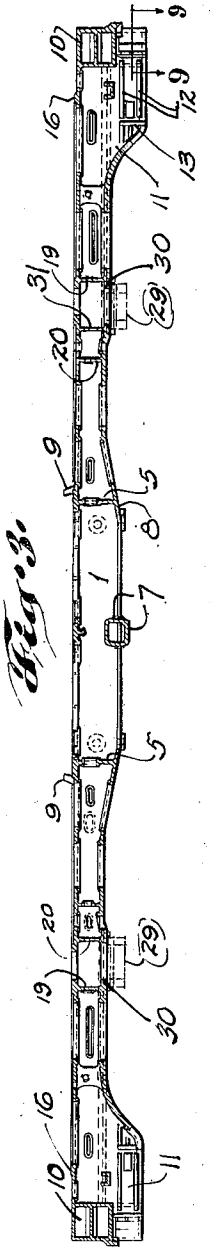

Fig. 3.

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Fig. 4.

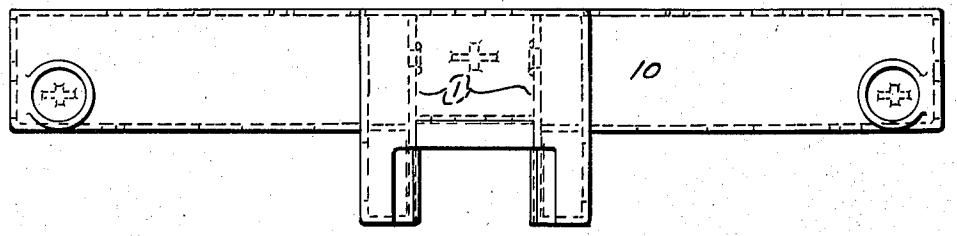

Fig. 5.

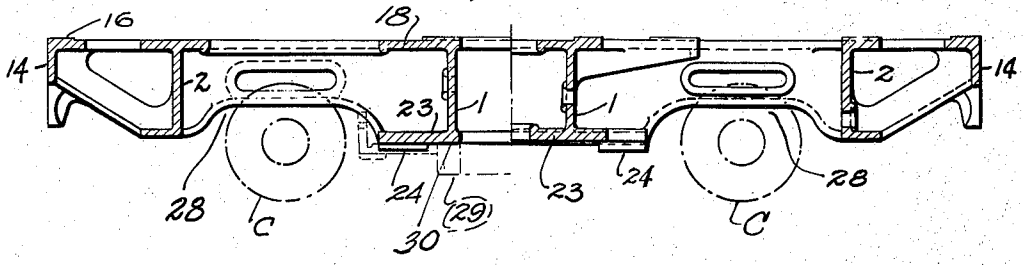

Fig. 6.

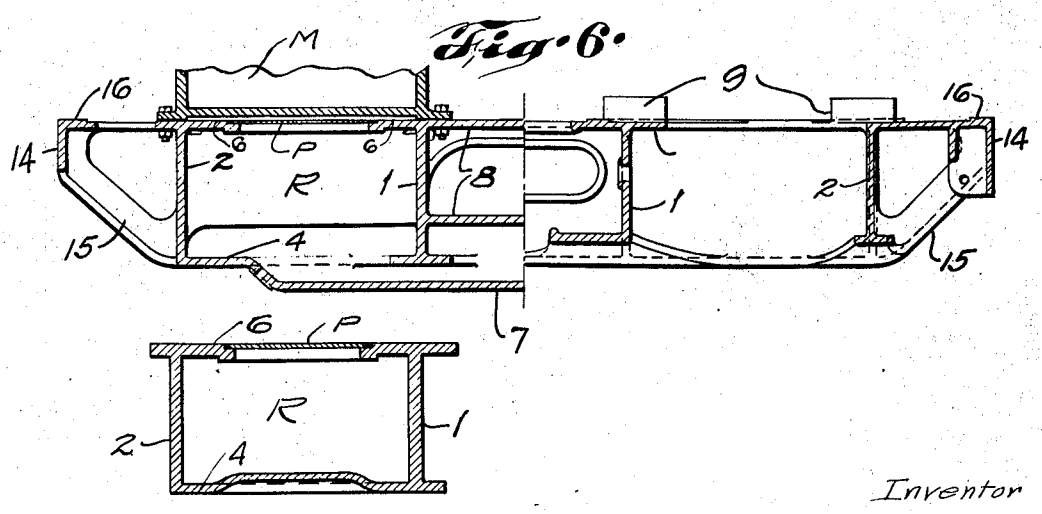

Fig. 11.

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Fig. 7.

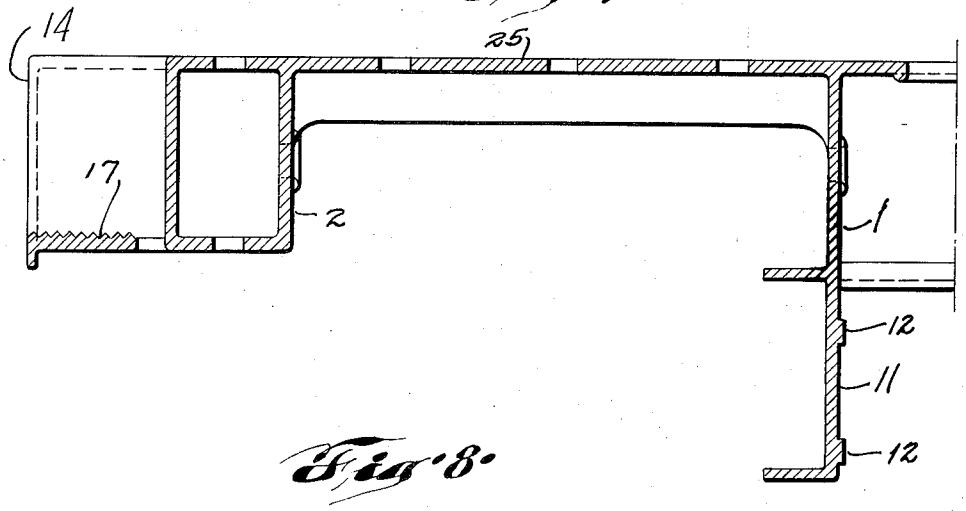

Fig. 8.

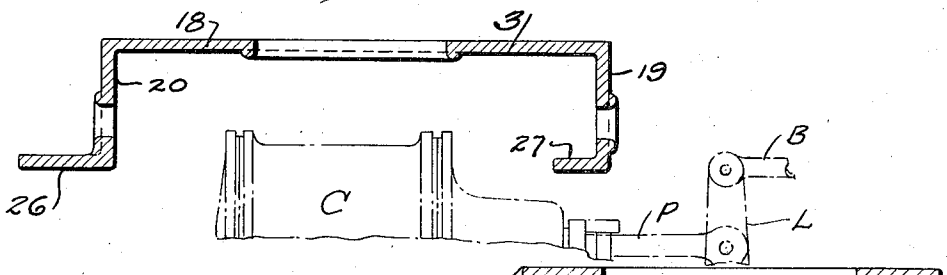

Fig. 9.

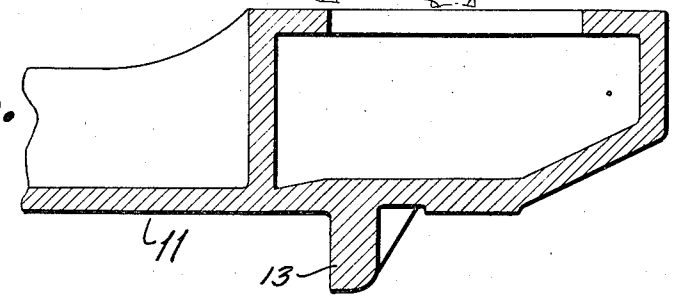

Fig. 10.

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Patented May 24, 1932 1,859,938

UNITED STATES PATENT OFFICE

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RAILWAY UNDERFRAME

Application filed November 10, 1930. Serial No. 494,781.

My invention relates to railway rolling stock and consists in a novel underframe structure particularly adapted for use in locomotives of the oil electric type which must carry heavy internal combustion motors and a supply of fuel oil for the same.

The main objects of my invention are to form a strong light underframe structure adapted to carry motors of the class referred to and to provide fuel reservoirs therefor and to maintain a low center of gravity for the structure.

It is also an object of my invention to produce the underframe in an integral structure, preferably made of a single casting, whereby the rigidity of the frame will be secured without the necessity of frequent inspection and repairs, such as is required for built-up structures having a number of parts riveted or bolted together to form joints which work loose. Incidentally, such joints require additional flanges on the connected members, the metal of which flanges is not used as effectively as in a cast structure where masses of metal need be used only where they contribute necessary strength to the structure.

Another object of my invention is to provide a suitable support for the cab.

These and other detailed objects of my invention are attained by the structure shown in the acompanying drawings in which—

Figure 1 is a top view of an underframe embodying my invention.

Figure 2 is a side view of the same.

Figure 3 is a vertical section taken on the longitudinal center line of the underframe.

Figure 4 is an end view of the underframe.

Figures 5, 6 and 7 are vertical transverse sections taken on the corresponding section lines of Figure 1.

Figure 8 is a detail longitudinal section taken on the section line 8—8 of Figure 1.

Figure 9 is a horizontal section taken on the line 9—9 of Figure 3.

Figure 10 is a detail of the reservoir wall which will be referred to later.

Figure 11 is a vertical transverse section on line 11—11 of Figure 1.

The underframe includes four main longitudinal vertical members or sills 1, 1, 2, 2. These sills carry the major portion of the load between the bolsters 3 and also transmit the longitudinal forces applied to the underframe. These sills are deepened intermediate the bolsters and sills 1 and 2 on one side of the longitudinal center line of the locomotive have the lower portions of the deepened parts connected by a corrugated web 4 formed integrally therewith. Transverse members 5 brace the longitudinal members 1 and 2 and form, with the latter, side walls of oil reservoirs or tanks R located on each side of the center of the frame. The underframe sills are provided with upper flanges 6 forming top wall elements of the reservoirs and preferably completed by means of plates P which are welded to the edges of flanges 6 to complete the reservoir top wall. A conduit between reservoirs R is provided by the elements 7 whereby the liquid in both reservoirs is maintained at the same level. These elements 7 also from a substantial tie between the pairs of sills 1, 2 on opopsite sides of the underframe.

If greater capacity is desired, the space between sills 1 may be utilized as a reservoir, the horizontal webs or braces 8 being made continuous and suitable openings provided in the sills 1 to permit liquid to pass between the reservoir outside of the sill 1 and the space inside of the sill 1.

The motors will be mounted on the bed preferably by being bolted to the flanges 6. To free the holding bolts from undue stresses resulting from the starting and stopping of the locomotive, I provide lugs 9 which form stops for engaging the ends of the motor frame. I show such a motor at M (see Figure 6) with its base or lower crank case or member immediately over one of the reservoirs R.

The frame also includes box shaped end sills 10 and the sills 1 are extended downwardly at their ends to provide draft sills or housing forming members 11 which, preferably, have the draft gear guiding elements 12 and stops 13 integral therewith. Plates 25 constitute platform-like extensions of the top walls of sills 10 and the ends of plates 25 are recessed and depressed to provide steps 17.

Side members 14 extend from platform to platform and are supported from sills 2 by integral brackets 15. A suitable pad 16 extends all around the underframe on members 14 and plates 25 and is adapted to be finished to mount the superstructure.

Each of the bolsters 3 comprises a top member 18 and vertical walls 19 and 20 which member and walls extend substantially from end to end of the bolster. A bottom member 23 extends between walls 19 and 20 and from the side bearing 24 on one side of the underframe to the side bearing 24 on the other side of the underframe. This provides a bolster having a box shape between the side bearings and having an inverted U shape outwardly of the side bearings. This construction permits a brake cylinder C, or other equipment mounted on the truck beneath the bolster, to project upwardly below the level of the bottom of the bolster and between walls 19 and 20. It is desirable to reinforce the bolster walls 19 and 20 with suitable flanges and these are indicated at 26 and 27 (see Figure 8). By turning flange 26 outwardly of the bolster side wall 20, I increase the clearance for the rear end of brake cylinder C so that it does not contact with the bolster wall 20 when the truck pivots on the underframe. By turning flange 27 inwardly of the bolster side wall 19, I increase the clearance for the upper end of the brake lever L to which the brake rod B is connected. This construction facilitates the location of the bolster wall 19 as near as possible to the end of the car, in view of the upstanding brake lever L, the position of which is determined by the location of the truck which, of course, is pivoted to the underframe through the center plate structure 29 located as near the end of the car as is practical in view of the draft gear.

As a result of constructing a bolster adapted to meet these conditions arising from the relative position of the truck center plate and air brake elements, I produce a bolster in which the center plate mounting portion indicated at 30 is nearer to one side of the bolster than to the other side, as best seen in Figure 1. Preferably, in an oil electric locomotive an air conduit will be provided extending down through the bolster and the center plate to the motors mounted on the truck. I show a portion of this conduit formed by the bolster front wall 19 and by an intermediate wall 31 extending between sills 1. It is desirable that the bolster brace longitudinal sills 1 and 2 throughout their depth and therefore the portions of the bolster adjacent these sills should be as deep as these sills. Since these sills extend downwardly below the level of the top of the brake cylinder and associated parts, I have provided upwardly extending recesses in the lower parts of walls 19 and 20 as indicated at 28 in Figure 5.

The above description includes a number of details of construction which may be varied substantially, or omitted from the underframe, without affecting other features of my invention and I refer particularly to the extent and direction of the corrugations in webs 4, to the offset relation of the center plate and bolster, and to the arrangement of the pads for supporting the ends of the superstructure. Obviously these features could be changed and I desire to include within the scope of my invention all modifications of the construction which come within the scope of my claims.

I claim:

1. A railway vehicle underframe, comprising longitudinal sills having portions arranged to support a motor positioned above said sills, and members between said sills forming therewith a closed liquid reservoir below said portions.

2. In a railway vehicle underframe, a pair of spaced sills on each side of the longitudinal center line of the underframe, each pair of sills including portions arranged to carry a motor positioned above said sills, and members extending between each pair of sills and forming therewith a closed liquid reservoir between the center line of the locomotive and the side thereof and below said portions.

3. In a railway vehicle underframe, a pair of spaced sills on each side of the longitudinal center line of the underframe, each pair of sills including portions arranged to carry a motor positioned above said sills, members extending between each pair of sills and forming therewith a closed liquid reservoir between the center line of the locomotive and the side thereof and below said portions, and structure integral with said members and forming a conduit between said reservoirs.

4. In a railway vehicle underframe, longitudinal sills extending from end to end of the underframe and having their intermediate portions deepened, a web connecting the upper portions of said sills and forming therewith a support for a motor positioned above said sills, and a web connecting the lower portions of said sills, said webs and sills forming a closed liquid reservoir below said motor.

5. In a railway vehicle underframe, longitudinal sills extending from end to end of the underframe and having substantially deepened central parts, the upper portions of said sills at said deepened parts forming a support for a motor positioned above said sills, and a web connecting the lower portions of said sills at said deepened parts and forming therewith the bottom and sides of a liquid reservoir below said motor.

6. In a railway vehicle underframe, longitudinal sills constituting supports for a motor superimposed thereon, a web connecting the lower portions of said sills and forming

a transverse brace between said sills and also forming the bottom of a reservoir having said sills for side walls.

7. In a railway vehicle underframe, longitudinal sills constituting supports for a motor superimposed thereon, a web connecting the lower portions of said sills and forming a transverse brace between said sills and also forming the bottom of a reservoir having said sills for side walls, said web being corrugated throughout a substantial portion of its extent.

8. In a railway vehicle underframe, longitudinal and transverse vertical webs having portions for supporting a motor to be superimposed thereon, and vertically spaced members connecting said webs and forming therewith a liquid reservoir having side, top and bottom walls below said portions.

9. In an underframe, spaced longitudinal webs, spaced transverse webs, vertically spaced members connecting said webs and forming therewith a liquid reservoir having side, top and bottom walls, certain of said webs being adapted to support a motor to be superimposed thereon.

10. In a railway vehicle underframe, longitudinal sills adapted to mount a motor superimposed thereon, members cooperating with said sills to form therewith a liquid reservoir beneath a motor mounted thereon, certain of said sills extending longitudinally of the underframe beyond said motor mounting and reservoir forming portion and constituting draft gear housing structures.

11. In a railway vehicle underframe, spaced longitudinal sills including elements for mounting a motor superimposed thereon, outwardly extending brackets on the outer of said sills, longitudinal side members carried by said brackets, end sills, and a cab support element on said side members and end sills extending substantially continuously around said underframe.

12. In a railway vehicle underframe, spaced longitudinal sills including elements for mounting a motor superimposed thereon, brackets integral with and extending outwardly from the outer sills, longitudinal side members integral with the outer ends of said brackets and extending substantially throughout the length of the underframe, end sills integral with and connecting the ends of said side members, and a cab support element integral with said side members and end sills and extending substantially continuously around the sides and ends of said underframe.

13. In a railway vehicle underframe, longitudinal and transverse webs on each side of the longitudinal center line of the frame including elements forming supports for motors carried on opposite sides of the underframe, and horizontal members spaced vertically of each other and connecting said webs and forming therewith liquid reservoir structures on each side of the underframe below said elements, and a tie member extending from said structure on one side of the underframe to said structure on the other side of said underframe, said tie member being hollow to provide a liquid conduit between the interior of said reservoir structures.

14. In a railway vehicle underframe, longitudinal sills deepened intermediate their ends and adapted to mount a motor on their deepened portions, and said depeened portions also forming liquid reservoir walls.

15. In an underframe of the class described, horizontal elements for mounting a separately formed motor carried on the underframe, and upstanding members integral with said elements and forming stops for engaging a motor to hold the same against longitudinal movement.

16. A one piece casting comprising a railway locomotive underframe and including longitudinal sills provided with elements for supporting superimposed motors on each side of the longitudinal center line of the frame, and side members spaced from said elements, and end members connecting said sills and side members, there being a continuous pad on said side members and end members extending substantially entirely around the underframe for mounting a cab structure.

17. In a railway vehicle underframe, longitudinal center sills, and a bolster, side bearings on said bolster spaced from said center sills, said bolster having a box shaped center portion extending between said side bearings, and substantially inverted U-shaped portions at the sides of said center portion.

18. In a railway vehicle underframe, a longitudinal sill and a bolster having a box shaped center portion and a substantially inverted U-shaped portion at the side of said center portion, said U-shaped portion having its walls spaced apart so as to receive between them and to clear a brake cylinder mounted upon a truck beneath said bolster.

19. In a railway vehicle underframe, a bolster including an inverted U-shape section arranged to extend over a truck, there being reinforcing flanges on the lower edges of the walls of said section, one of said flanges extending from the outer side of its wall to increase the distance between said walls to provide clearance for equipment mounted on the truck and projecting upwardly adjacent to the inner side of said wall, and the other of said flanges extending from the inner side of said wall to provide clearance for equipment mounted on the truck and projecting upwardly adjacent to the outer side of said wall.

20. In a railway vehicle underframe, a bolster including upright walls spaced longitudinally of the underframe, and center plate mounting elements on said bolster located

nearer to one of the side walls of said bolster than to the other side wall.

21. In a railway vehicle underframe, a bolster including upright walls spaced longitudinally of the underframe, said bolster providing an air conduit and center plate mounting structure both nearer to one of the side walls of said bolster than to the other side wall.

22. In a railway vehicle, a center sill member, a longitudinal sill member spaced from said center sill member, and a transverse bolster extending between said sill members with end portion corresponding in depth to the depth of said sill members and with its intermediate portion recessed upwardly above the level of the bottom of said sill members to clear equipment mounted on a truck beneath the bolster and between said sill members.

23. In a locomotive, an engine including a base or lower crank case member, an underframe for supporting said engine member and provided with a liquid reservoir located below said engine member and forming a part of said underframe.

24. In a locomotive, an engine including a crank case or base, an underframe including longitudinal sills for supporting said engine, transverse members connecting said sills, said sills and members having webs forming the side walls of a liquid compartment located below said engine.

25. In a railway car underframe, a bolster, side bearing elements carried by said bolster, said bolster having a box section extending from one side bearing to the other and having an inverted U section outwardly of said side bearings.

In testimony whereof I hereunto affix my signature this 30th day of October, 1930.

WILLIAM M. SHEEHAN.